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Report No. 6

**QUARTERLY PROGRESS REPORT
REPEATER, TELEGRAPH TH-38(Y)G.**

Covering Period:

1 July 1960 - 30 September 1960.

Signal Corps Report: DA 36-039 SC-87254

Signal Corps Technical Requirement
SCL-4067, dated 28 October 1958
Amendment No. 1, dated September 1960
Project No. 3B21-06-001-03

Object:

The objective of this contract is to develop a highly reliable Telegraph Repeater for field use.

Prepared for:

U. S. Army Electronics Research
and Development Laboratories

Prepared by:

Radiation Incorporated
Melbourne, Florida

DEC 5 1960

THOMAS A

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I PURPOSE

This project consists of the design, development and fabrication of twenty Telegraph Repeaters TH-38()G, along with documentation as required by the contract. The repeater must be designed to operate in half duplex, full duplex or half duplex-full duplex. Using the converter, circuits of differing characteristics may be interconnected and normal traffic established.

A prime requisite of the contract is to achieve a Mean Time Between Failure of 57,000 hours.

Fabrication of the twenty repeaters will be divided into three phases. Two engineering test models will be fabricated and submitted to USAELRDL for operational and environmental evaluation. Then eight more engineering test models, incorporating any required changes will be built and put on life test along with the first two repeaters. The final phase will consist of the fabrication of ten service test models for field use.

II ABSTRACT

telegraph
The two redesigned ~~Repeaters~~ ~~Telegraph TH-38 ()G, Engineering~~
~~Test Model units~~ were completed, ~~Vibration, Drop and RFI tested, prior~~
~~to delivery to USAELRDL as Contract Item 2a, which also was accomplished~~
~~during this quarter.~~

One of the TH-38 units, S/N 2R0, underwent Temperature, Altitude and Bounce tests and operated properly following each of them. The other unit, S/N 1R0, underwent thorough electrical tests ~~in accordance with SCL 4067 and RFI tests in accordance with MIL I 11748,~~ and met all specifications.

Failure of the shock mounts and other items noted in detailed inspection of equipment were ~~called to the attention of Radiation Incorporated~~
noted for correction on future models. These changes are reported.

III PUBLICATIONS, REPORTS AND CONFERENCES

A. Publications

The Repair Parts Selection List, Contract Item 7, was submitted during the quarter.

B. Reports

- (1) Monthly Performance Summaries were prepared and submitted to USAELRDL.
- (2) Quarterly Report No. 5 was prepared and submitted to USAELRDL in final form.
- (3) The Summary of RF Interference Measurements performed on TH-38()G, S/N 1 were delivered to USAELRDL on 26 July 1963.
- (4) A preliminary submission was made (Item 6) of Visualization Data for evaluation and suggestions by the Contracting Officer's Technical Representative or the Project Engineer. The reply to this letter, dated 25 September 1963, will be provided the Art Department for use in preparing the final version of Item 6, Visualization Data.

C. Conferences

Four conferences were held during this report period.

Conference held at USAELRDL on 15 July 1963, at which time two Engineering Test Models of the TH-38()G were delivered. Those in attendance at this conference were:

J. A. Buegler	USAELRDL
J. Lemig	USAELRDL
J. Duffy	USAELRDL
J. Crawford	USAELRDL

C. Conference (Continued)

J. S. Norcross	Radiation Incorporated
W. Premaza	Radiation Incorporated
J. C. Williams	Radiation Incorporated
T. O. Willis	Radiation Incorporated

This conference covered the delivery of the two TH-38 Engineering Test Models, their performance and any possible problem areas which might occur during tests at USAELRDL. Radiation's fullest cooperation was assured to speed the test program to successful completion.

Another short, informal conference was held between Messrs. Norcross, Williams and Premaza of Radiation Incorporated and Mr. J. Lemig of USAELRDL on Friday 26 July 1963 at USAELRDL. This conference was only a brief discussion. RFI Test information was provided.

A third conference was held at USAELRDL on 12 August 1963.

Those in attendance were:

J. Lemig	USAELRDL
F. Deptula	USAELRDL
T. O. Willis	Radiation Incorporated

The purpose of Mr. Willis's trip to USAELRDL was to seek a solution to technical difficulties being experienced in the TH-38 unit undergoing electrical performance tests. This problem was solved without further delay allowing tests to proceed to completion.

C. Conference (Continued)

The fourth conference was held at Radiation Incorporated on 25 and 26 September 1963. Those in attendance were:

J. Lemig	USAELRDL
J. Duffy	USAELRDL
E. Dorsett	Radiation Incorporated
J. S. Norcross	Radiation Incorporated
J. C. Williams	Radiation Incorporated

The purpose of this conference was to review the tests performed on the two engineering test model TH-38 units at USAELRDL and to discuss certain possible modifications, changes and/or additions to future units to be built by Radiation Incorporated under this contract.

IV FACTUAL DATA

A. General

Certain personnel changes were made on the TH-38 program during this quarter. These changes were made in order to enhance the technical support and were from time to time modified during the period to handle the various items which came up. Publications, Manufacturing and other services groups were utilized as required for the various contract items submitted during the period.

The Test Program at USAELRDL extended through most of the quarter, the two TH-38 equipments (Contract Item 2a), having been delivered early in the quarter.

Toward the end of the quarter the two engineering test models TH-38 units completed tests at the USAELRDL and were returned to Radiation Incorporated for incorporation of certain modifications, changes and assurances to be provided in subsequent models.

B. Delivery of Two Each TH-38()G Test Models

Delivery of the two TH-38 Test Models was accomplished early in this quarter, on 15 July 1963. These units were immediately placed on tests. One unit, S/N 1R0, was subjected to exhaustive Electrical and RFI tests, and the other, S/N 2R0, was subjected to mechanical service

IV Factual Data (Continued)

conditions tests with performance tests before and after each of the tests in the series. Radiation Incorporated was kept posted as to the progress of tests by telephone during the testing program. Close liaison was maintained in order that any problems which might arise could be solved without delaying the test program. RFI Test information was provided on Friday 26 July covering the RFI testing program performed at Radiation Incorporated prior to delivery of the equipment. An engineering design was completed on a packaged RFI filter to replace the individual component network provided in TH-38, S/N 1R0 which underwent RFI tests. This filter, Sprague JN 17-2441 (Radiation No. 104812-1), will be used in subsequent units.

C. Test Program at USAELRDL

Certain difficulties were encountered during the test program at USAELRDL which were solved without extensive delays. Two transistors which failed due to inadvertent erroneous operation of the equipment were replaced in short order and the tests resumed. Later, when performance fell below that specified in certain operational parameters, it was discovered that the quality of one of the two transistors replaced was below the manufacturer's specifications tolerance for this type transistor. When this device was replaced by one within manufacturer's specification tolerances,

C. Test Program at USAELRDL (Continued)

the unit performed per specification. This problem was solved with only minor delay to the test program.

The mechanical service conditions tests, primarily the Bounce Test, resulted in fracturing the shock isolation mounts incorporated in the equipment transit case. These mounts built by Barry Controls, Inc., were provided to afford maximum isolation between the equipment and the transit case to limit the shock developed by the two foot drop test.

All other tests of the equipment indicated proper and within specifications operation in all respects. Proper operation was obtained after the Bounce Tests in which the shock isolators were fractured and the equipment sustained greater than specified physical stresses.

D. Shock Mounts

As a result of the failure of the shock isolators, Barry Controls Type 16885-3, a different device, a mesh type mount, Type 2004-2, which is not susceptible to temperature extremes and which is suited to the Drop and Bounce requirements has been substituted in the equipment transit case. The TH-38 unit, S/N 2R0, will be returned early during the following period for retesting in the Bounce Test, a Drop Test and a Humidity Test.

V CONCLUSIONS

It is anticipated that the TH-38 unit 2R0 will successfully pass retests, the remaining tests and allow a prompt, unrestricted go ahead for the next eight units (Item 2b), which together with the first two units (Item 2a), will undergo reliability tests.

VI PROGRAM FOR THE NEXT QUARTER

The retesting of TH-38 S/N 2R0 under the Bounce, Drop and Humidity Tests will be completed during the next quarter. In view of the electrical acceptability of the TH-38 units, component parts will be procured and by the time a full go ahead is secured from USAELRDL, parts should be on hand for start of fabrication of eight units. No delay as a result of the retesting is anticipated. All requested changes and modifications, with the exception of those on which a waiver request is submitted will be accomplished during the next quarter.

VII KEY PERSONNEL

Following is a list of Key Personnel and the hours expended by each during the reported quarter:

E. A. Dorsett	112
T. O. Willis	286

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CONTRACT SC-87254

FOURTH QUARTERLY REPORT

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